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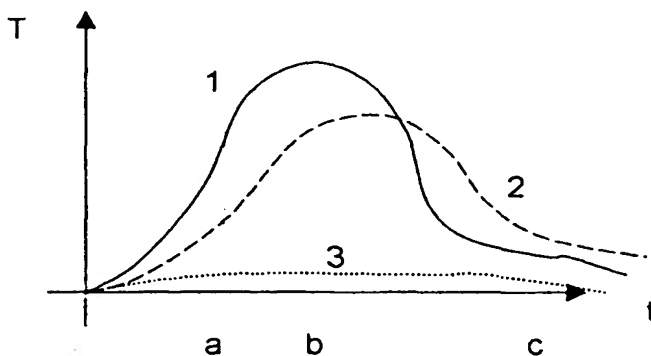
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(54) Title: METHOD AND RELEVANT DEVICE FOR REVEALING OBJECTS



(57) Abstract: The invention concerns a method, and rele-
vant device, for remote sensing objects, characterised in that
said objects are in a condition of thermal emission that is
variable during time, and in that it comprises the following
phases: A. acquisition of a map of the radiation coming from
the surface of the portion of space within or behind which the
object to be sensed is supposed to be, at least at a first time
 t_1 and a second time t_2 , such times being successive to each
other; B. acquisition of map of the radiation coming from the
surface of said portion of space, considered at a third instant
 t^* different from said at least two times t_1 and t_2 ; C. summa-
tion of he maps of said at least two times t_1 and t_2 as obtained
from the phase A; D. subtraction of the map at said time t^* as
resulting from the phase B, from the sum as resulting from

the phase C, E. comparison between the values of each portion of map area as resulting from the phase D and a threshold value of
the radiation intensity for the material of the sought objects; F. identification of the material of the object under investigation with
the sought material, when the result of the comparison of the phase E has provided the presence of at least a certain number n of area
portions of said space portion, with $n \geq 1$, whose value for said radiation is larger than said threshold value.

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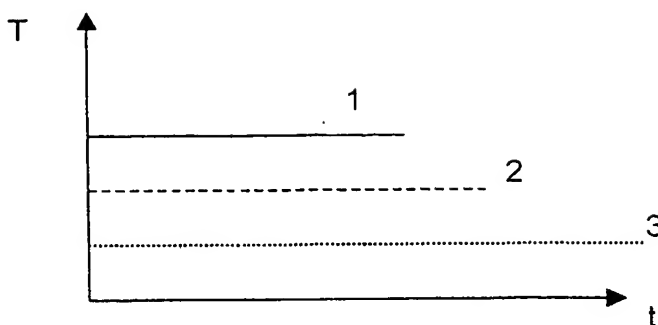


Figura 1

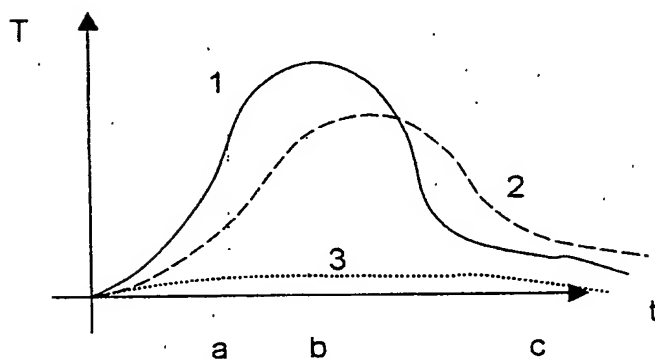


Figura 2

Figura 3

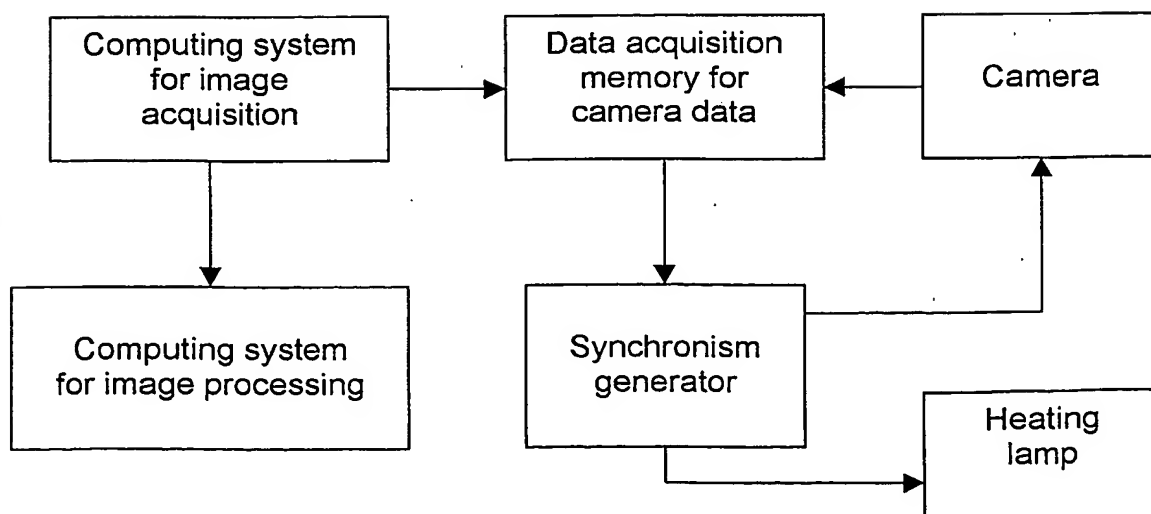




Fig. 4



Fig. 5

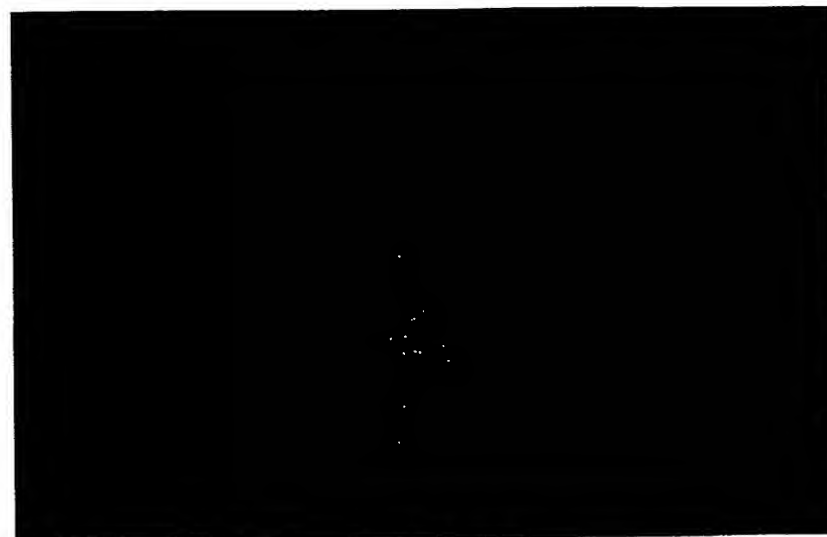


Fig. 6

Fig. 7

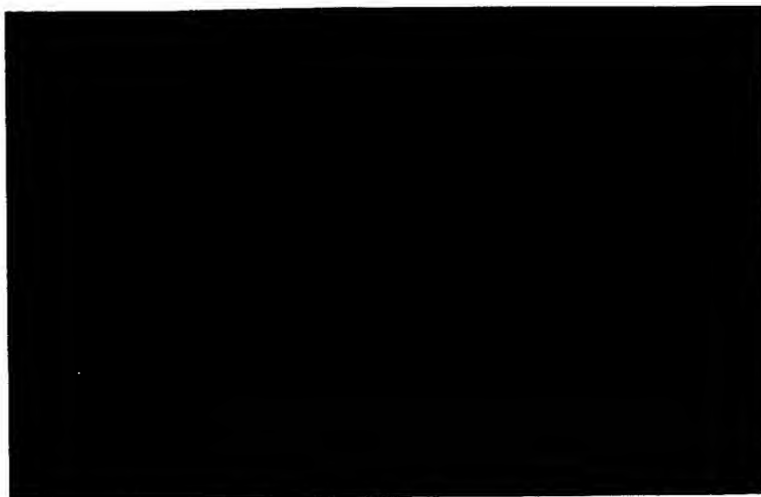


Fig. 8

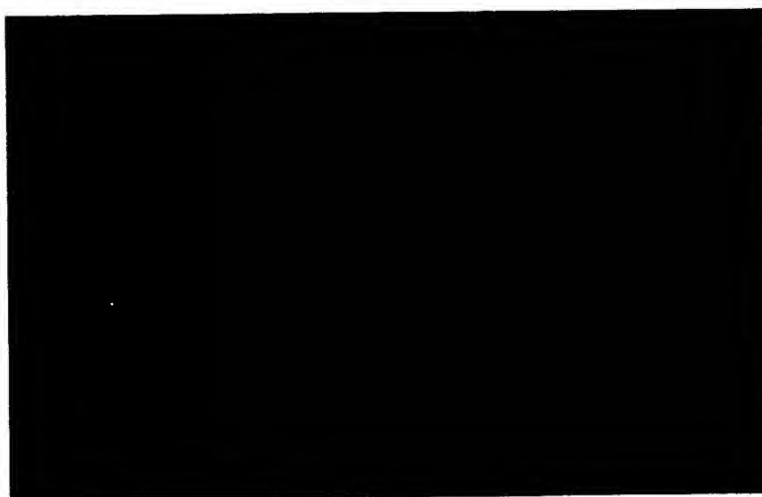


Fig. 9



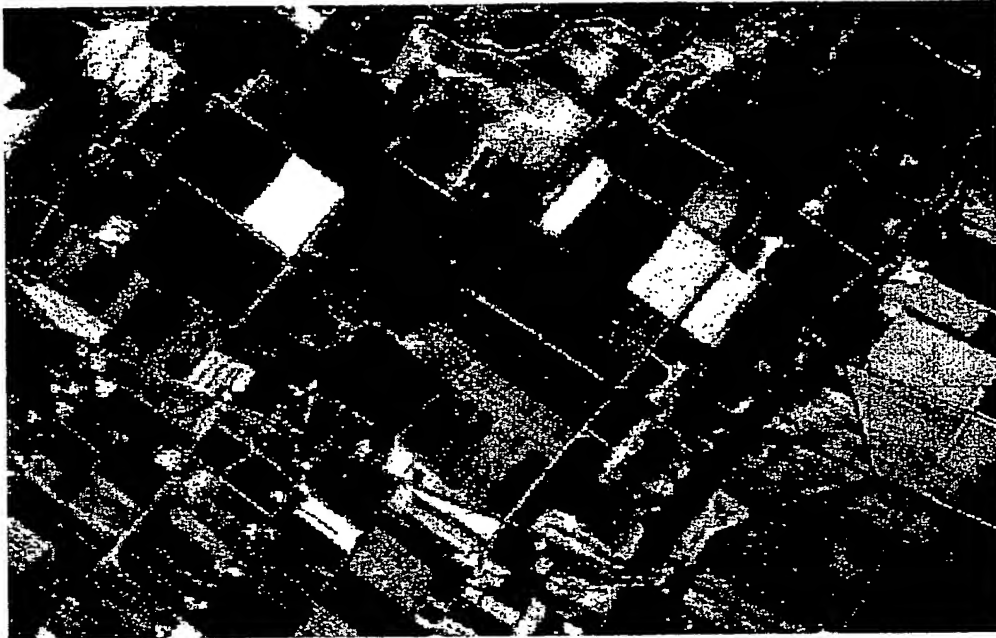


Fig. 10



Fig. 11

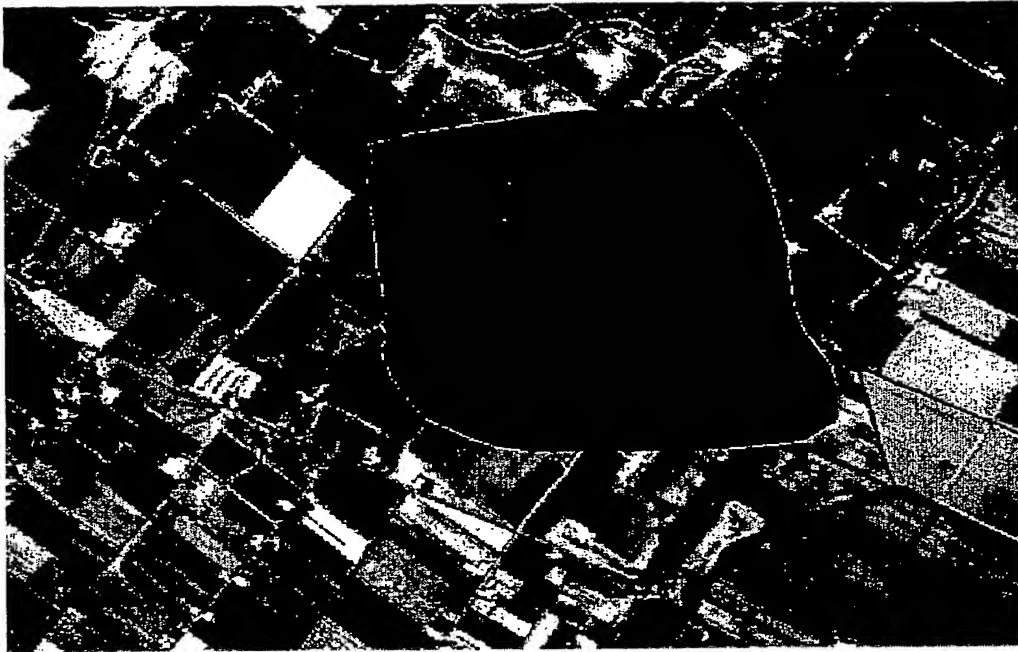


Fig. 12



Fig. 13

INTERNATIONAL SEARCH REPORT

Inter al Application No

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A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	LI P ET AL: "INFRARED IMAGING OF BURIED OBJECTS BY THERMAL STEP-FUNCTION EXCITATIONS" APPLIED OPTICS, OPTICAL SOCIETY OF AMERICA, WASHINGTON, US, vol. 34, no. 25, 1 September 1995 (1995-09-01), pages 5809-5816, XP000523008 ISSN: 0003-6935 page 5813, left-hand column, line 24 -right-hand column, line 9 page 5814, left-hand column, line 33 -right-hand column, line 12 ---	1,2,4-7, 16,18, 19, 22-24, 26-29
A	DE 100 32 698 A (SCHRODT STEPHAN) 17 January 2002 (2002-01-17) column 3, line 64 -column 4, line 24; claims 1,4,49,50 ---	1,2,4,5, 15,16,22
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International Application No

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C.(Continuation) DOCUMENTS CONSIDERED RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 217 550 A (BIRMAN JOSEPH H) 16 November 1965 (1965-11-16) claims ----	1,2,4
A	EP 0 825 459 A (SUMITOMO ELECTRIC INDUSTRIES) 25 February 1998 (1998-02-25) column 11, line 1 - line 30 ----	1
A	GB 2 294 604 A (MARCONI GEC LTD) 1 May 1996 (1996-05-01) -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date		Patent family member(s)		Publication date
DE 10032698	A	17-01-2002	DE	10032698 A1		17-01-2002
US 3217550	A	16-11-1965	NONE			
EP 0825459	A	25-02-1998	JP	10117424 A		06-05-1998
			AU	724951 B2		05-10-2000
			AU	3524697 A		26-02-1998
			CA	2213641 A1		23-02-1998
			EP	0825459 A2		25-02-1998
			NO	973883 A		24-02-1998
			US	6244106 B1		12-06-2001
GB 2294604	A	01-05-1996	DE	19539368 A1		14-08-1996
			FR	2726145 A1		26-04-1996